STORMWATER MANAGEMENT FOR LANDSCAPE PROFESSIONALS

Gail Shaloum  Soak It In  March 1, 2019
LANDSCAPERS –
The Unsung Heroes of Stormwater Management
LEARNING OBJECTIVES

• Review the impact of stormwater pollution on watershed health
• Know the regulatory background intended to protect water quality
• Understand the design intent and identify the key components of common stormwater facilities.
• Be able to explain basic operational and maintenance practices for common stormwater facilities.
WHY CARE ABOUT WATER QUALITY?
Groundwater provides 70% of Oregon’s water supply.

True or False?
Factories are the primary source of water pollution.

True or False?
Sediment is the largest non-point source contributor of water pollutants.

True or False?
WATER POLLUTION FACT VS MYTH

Wetlands play a critical role in water quality.

True or False?
IMPACTS OF URBAN DEVELOPMENT
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POLICY: CLEAN WATER ACT

• Established the basic structure for regulating pollutant discharges into the waters of the United States.
• Gave EPA the authority to implement pollution control programs
• Recognized the need for planning to address the critical problems posed by nonpoint source pollution.
CLEAN WATER ACT (EPA) → OREGON DEQ

WATER ENVIRONMENT SERVICES

LANDSCAPE CONTRACTORS ← SW FACILITY OWNERS
BMPs: ILLICIT DISCHARGE PREVENTION
BMPs: EROSION CONTROL
BMPs: EROSION CONTROL
BMPs: STORMWATER FACILITIES

**STRUCTURAL**
- Catch basins
- Underground pipes
- Water quality manholes
- Proprietary devices

**VEGETATED**
- Rain gardens
- Planters
- Swales
- Ponds
- Wetlands
- Riparian buffers

**LOW IMPACT DEVEL.**
- Greenroofs
- Porous pavement
- Street trees

Purpose: to reduce the effects of urbanization on water bodies
BASIC FUNCTION

WATER IN

FLOW SLOWS,
POLLUTION FILTERED,
SEDIMENT DROPS OUT

WATER OUT
(or not)

WATER OUT
(or not)
Figure 1: Cross-section of a typical rain garden.

(Graphic by East Multnomah Soil and Water Conservation District [EMSWCD])
SW FACILITIES: VEGETATED SWALES
SW FACILITIES: RAIN GARDEN

GEOMETRIC AND LINEAR
SW FACILITIES: RAIN GARDEN

NATURAL AND WILD
SW FACILITIES: STORMWATER PLANTER

URBAN PLAZA, INTEGRATED
SW FACILITIES: STORMWATER PLANTER

ROADSIDE PLANTERS
DO THEY WORK?
HOW DO THEY WORK?

- Plant metabolism & release into atmosphere
- Storage in plant biomass
- Bio-degradation via bacteria
- Storage in root zone
COMPONENTS

TREATMENT AREA

SIDE SLOPES
COMPONENTS

TREATMENT AREA

SIDE SLOPES
COMPONENTS

RIP RAP

FOREBAY
COMPONENTS

CHECK DAM
COMPONENTS

FABRIC OR JUTE MATTING
COMPONENTS

OUTLETS
COMPONENTS

UNDERDRAINS
COMPONENTS

LOW IMPACT ACCESS

- Foot traffic can exert as much pressure as a small pickup.
- Worst compaction occurs within top 4 to 10 inches of soil.
Why do we care?
DEVELOPMENT REVIEW

• All development that results in 5,000 square feet or more of new impervious surface is subject to WES stormwater standards, including water quality, infiltration, and detention.

http://www.clackamas.us/wes/
MAINTENANCE AGREEMENTS

PRIVATE STORMWATER FACILITIES MAINTENANCE PLAN

Location:

Tax Lot:
Street Address:
City, ST, ZIP:

Facilities to be maintained:
- Trapped Catch Basin(s)
- Drywell(s)
- Lineal feet - 12" storm line
- Lineal feet - " storm line
- Pollution control manhole(s)
- Outlet control manhole(s)
- Detention pond(s)___ [tank(s)]___ (Check one or both.)
- Other facilities as described:

Acknowledgment:
- The owner(s) will maintain the above private storm drainage facilities annually. All oils, sediment and debris will be removed and deposited in an approved dumpsite. Any damaged equipment will be repaired promptly.

Facilities to be maintained:

Acknowledgment:

Date of agreement:

Notary Public for Oregon

My Commission Expires:

Private Storm Maintenance Agreement.doc
As part of the Clackamas County Water Environment Services’ (WES) business inspection, technical assistance and outreach program, I am contacting you with regard to your property located at the address above. WES’ Surface Water Management Rules and Regulations require that owners of private storm water systems provide annual reporting to WES of the annual inspection and any cleaning or maintenance of their system that was performed. These systems require maintenance to remove contaminants (litter, oil, grease, leaves, dirt, etc.) that can clog pipes, cause flooding, and eventually end up polluting our local streams if not removed.

A recent outreach program found that many businesses were not only unaware of these requirements, but that they also had questions on the specifics of their storm system, proper maintenance techniques and how to prevent pollution from entering the storm system. To assist our customers and to meet the Oregon Department of Environmental Quality requirements that WES ensure that private systems are functioning properly, we are conducting onsite inspections of commercial/industrial properties beginning in September and October of 2018.

To schedule a date and time for this inspection, please contact me at:

Water Environment Services #430  
ATTN: John Nagy  
150 Beavercreek Rd  
Oregon City, OR 97045

Inspections are likely to take about 45 minutes but may vary by the complexity of the site. Please do not hesitate to contact me for assistance or clarification with this request.

Sincerely,

John Nagy, Technical Services Specialist
Types of Storm Structures/Facilities Onsite: Catch basins w/ siphons, pipes, Stormceptor, detention pipe and access & flow control manholes.

Last Annual Report Received: August 24, 2017

Inspection Findings:
- Fresh leaves in drains but all 5 appeared to have been cleaned in recent past. No apparent structural defects.
- Stormceptor appeared to have been cleaned but was full of water so difficult to determine.
- South Access manhole for the detention pipe/tank had a few inches of dirt and debris in the bottom.
- Flow Control manhole was buried under landscaping. Located and opened: shear gate closed.

Required Actions:
- Clean South Access manhole of the detention pipe.
- Clean Flow Control manhole.
Types of Storm Structures/Facilities Onsite: The detention pond was built in 2000 and receives stormwater from one storm line that enters the pond on SE Clark Lane. The facility was originally built with a 6 foot wide swale that is approximately 125 feet long. The As-Built drawings for the detention pond are included as Exhibit A.

Inspection Findings:
- The swale is overgrown with vegetation that needs to be removed.
- Sediment needs to be clean out.
INSPECTION AND REPORTING

Required Actions:

• **Vegetation Removal** – Remove all vegetation from pond bottom to restore the pond bottom to As Built elevation of 193.5 ft.

• **Sediment Removal** – Remove sediment from bottom of pond to restore the original swale to as-built conditions. Properly dispose of all organic material at an approved disposal location.

• **Restore Outfall Pad** – Remove sediment and vegetation from the Outfall Pad and replace the original rip rap as shown in Outfall detail of Exhibit A.

• **Re-Grade Swale** – regrade and restore the original location and design of the swale as shown in Exhibit A. Following removal of vegetation and regrading, provide jute matting on bottom and side slopes of the swale.

• **Re-seed** – seed all disturbed areas of the pond with the appropriate seed mixtures:
  - Pond bottom: wetland seed mix
  - Pond side slopes: upland seed mix
MAINTENANCE: RECORD-KEEPING

Annual Storm Drain Structure Maintenance Report

All privately owned storm drain structures must be inspected and maintained annually and the results of such activities reported annually.

Storm Drain Cleaning Assistance Program (SCAP)